DESCRIPTION

TRANSMISSION APPARATUS, RECEPTION APPARATUS

TECHNICAL FIELD

This invention relates to a transmission apparatus for transmitting broadcast contents and reception apparatus capable of receiving the broadcast contents transmitted by the transmission apparatus.

BACKGROUND ART

Recently, digital satellite broadcasts have been widely used. The digital satellite broadcast can transmit a high quality signal because of higher resistivity against noise or fading than, for example, existing analog broadcasting. Further, it improves a frequency utilizing efficient and can promote the multi-channel system. More specifically, the digital satellite broadcast with one satellite provides hundreds of channels.

Further, in the digital satellite broadcast, broadcasting of data content is carried out by the so-called data broadcasting service in addition to, for example, contents of video (moving picture)/audio as a general program.

The data broadcasting service is, for example, currently used such that the information for services such as stock prices, a weather forecast, various commercial messages, or the like is displayed by superimposing it on a picture of the usual

programs.

In consideration of such a background, it can be said that the situation also allows, as broadcast contents broadcasted by the digital satellite broadcast, data contents to be delivered in addition to the video/audio contents as existent general programs.

However, in the current situation, almost all uses of data broadcasting provide various types of information by displaying characters or a picture superimposed on pictures displayed as the general program.

Thus, there is ample room for improvement in its convenience of operation, or in making users, enjoying the contents received by digital satellite broadcast receivers, have more fun, by using data contents at a higher efficiency than the conventional situation.

DISCLOSURE OF THE INVENTION

In consideration of the above-described drawbacks, the present invention constructs a transmission apparatus as follow:

First production means is provided for producing a first content of a video signal and/or an audio signal.

Further, there is provided second production means for producing a second content, corresponding to the first content and formed with script for outputting a graphical interface, including a description, as the script, for causing a reception

apparatus to execute a process for producing use history information including a predetermined content in accordance with a result of use by a user of the reception apparatus related to the first content and a process for changing the graphical user interface so as to change a service to be provided with the operation to a user interface screen picture, on the basis of the use history information.

Further, there is provided sending means for providing, as a broadcast, a transmission output of the second content produced by the second producing means together with the first content produced by the first production means.

Furthermore, a reception apparatus is constructed as follows:

There is provided reception means capable of receiving a first content of a video signal and/or an audio signal transmitted as a broadcast and a second content, corresponding to the first content and formed with script for outputting a graphical user interface, including a description, as the script, for causing the reception apparatus to execute a process for producing use history information including a predetermined content in accordance with a result of use by a user related to the first content in the reception apparatus, and a process for changing the graphical user interface so as to change a service to be provided with the operation to a user interface screen picture, on the basis of the use history information.

Further, there is provided user interface forming means for forming a graphical user interface to be outputted together

with a picture as the first content in accordance with the script of the second content received by the reception means, producing and storing the above-mentioned use history information in accordance with the use result of the reception apparatus by the user, and executing, in accordance with a description of the script, a process for changing the graphical user interface so as to change the service to be provided with the operation to the user interface screen picture on the basis of the use history information.

According to the above-mentioned respective structures, a content (second content) is broadcasted as data for forming the GUI (Graphical User Interface) regarding the broadcast content as this video/audio signal together with the broadcast content (first content) corresponding to the general broadcast program content of the video/audio signal.

Further, the reception apparatus side receiving these contents executes a process to output the GUI together with the screen picture of a first content in accordance with the description of the script of the second content. Further, in accordance with the description of the above-mentioned script, the use history information is produced and stored in accordance with the use result of the reception apparatus by the user. Further, on the basis of the use history information, a process is executed to change the content of the service provided on the GUI screen picture. In accordance with this structure, the service content provided in the GUI is changed in accordance with the user's operation or behavior in response to a picture/audio output of the first content.

Further, this change of the GUI is obtained by a process in accordance with the script as the second content. In other words, the process concluded only within the reception apparatus provides a change of the GUI adaptive to a change in the content of the first content.

More specifically, there is provided first production means for producing a first content of a video signal and/or the audio signal.

Further, there is provided second production means for producing a second content, corresponding to the first content and formed with script outputting a graphical user interface, including a description for causing the reception apparatus to execute, as script, a process for changing a picture content in the graphical user interface in accordance with the change in the content of the first content.

Further, there is provided sending means for providing, as a broadcast, a transmission output of the second content produced by the second producing means together with the first content produced by the first production means.

Further, the reception apparatus may also be constructed as follows:

There is provided reception means capable of receiving a first content including a video signal and/or an audio signal transmitted as a broadcast and a second content, corresponding to the first content and formed with script outputting a graphical interface, including a description for causing the

reception apparatus to execute, as script, a process for changing a picture content in the graphical user interface in accordance with the change in the content of the first content.

Further, there is provided interface forming means for forming a graphical user interface so as to change the picture content in accordance with a change in the content of the first content in accordance with a description of script and for forming the user interface picture to be outputted together with a picture as the first content in accordance with the script of the second contents received by the reception means.

According to the above-mentioned structures, together with the broadcast content (first content) corresponding to the general broadcast program content using the video/audio signal (first content), a content (second content) is broadcasted as data for forming the GUI (Graphical User Interface) related to the broadcast content as the video/audio signal.

Further, the reception apparatus side receiving these contents executes a process to display the GUI screen picture together with the picture of the first content in accordance with the description of the script of the second content and a process for changing the display content of the GUI screen picture in accordance with the change in the content of the first content. In other words, according to the present invention, for example, added-value information to be displayed on the GUI screen picture regarding the first content adaptively changes in response to the change in the content of the first content.

Further, such a change in the GUI is obtained by the

process according to the script as the second content. More specifically, the process concluded within the reception apparatus can give the adaptive change of the GUI in response to a change in the content of the first content.

Further, as a transmission apparatus, it may also be constructed as follows:

There is provided a first production means for producing a first content of a video signal and/or an audio signal.

Further, there is provided second production means for producing a second content, corresponding to the first content and formed with script outputting a graphical user interface, including a description for causing the reception apparatus to execute, as script, a process for producing use history information including a predetermined content in accordance with the use result by a user of the reception apparatus related to the first content and a process for making a change in the picture content in the graphical user interface on the basis of the use history information.

Further, there is provided sending means for providing, as a broadcast, a transmission output of the second content produced by the second producing means together with the first content produced by the first production means.

Further, as a reception apparatus, it is constructed as follows:

There is provided reception means capable of receiving

the second content including a description for causing the reception apparatus to execute a process for producing a first content of a video signal and/or an audio signal transmitted as a broadcast and use history information of a predetermined content as script in accordance with the use result of the reception apparatus regarding the first content by the user, corresponding to the first content, formed with script for outputting a graphical user interface and a process for obtaining a change of the picture content on the graphical user interface on the basis of the use history information.

Further, there is provided interface forming means capable of forming a graphical user interface to be outputted with a picture as a first content in accordance with the script of a second content received by receiving means and, in accordance with the description of script, producing and storing use history information according to the use result of the reception apparatus by a user, and forming the graphical user interface to change the picture content on the basis of the stored use history information.

According to the above-mentioned structure, the content (second content) as data for forming the GUI related to the broadcast content as the video/audio signal is broadcasted together with the broadcast content (first content) corresponding to the general broadcasting content using the video/audio signal.

The reception apparatus side receiving these contents executes a process for displaying the GUI screen picture together with the picture of the first content in accordance with

the description of the script of the second content. Further, in accordance with the description of the above-mentioned script, use history information is prepared and stored in accordance with use of the reception apparatus of a user. Then, on the basis of the use history information, the process is executed for changing the display content of the GUI on the basis of this use history information.

According to this structure, the change of the display content of the GUI screen picture in accordance with the operation or behavior of the user responding to viewing the first contents of picture/audio.

The above-mentioned change of the GUI is obtained by the process in accordance with the script as the second content. In other words, the process concluded within the reception apparatus can provide a change in the GUI, which is adaptive upon the switching of the first content.

BRIEF DESCRIPTION OF DRAWINGS

Fig. 1 is a block diagram illustrating a structure of the entire part of a digital satellite broadcast system according to an embodiment of the present invention.

Fig. 2 is a block diagram illustrating a structural example of a content production system.

Fig. 3 is a block diagram illustrating a structural example of a digital satellite broadcast reception apparatus.

Fig. 4 is an illustration showing an example of a display condition of a top screen.

Figs. 5A to 5D are illustrations showing an example of

display transition on a cell display for a music gauge area.

Fig. 6 is an illustration showing an example of a display condition representing a list screen picture of the marked music.

Fig. 7 is an illustration showing an example of the display condition representing the list picture of all pieces of music.

Fig. 8 is an illustration representing an example of the display condition of a merchandise selection screen picture.

Fig. 9 is an illustration showing an example of the display condition of a user's selection screen picture.

Fig. 10 is an illustration of a structural example of the broadcast content according to the present embodiment.

Fig. 11 is an illustration showing a structural example of user-related information.

Fig. 12 is an illustration showing a structural example of a PV viewing history information.

Fig. 13 is an illustration showing a structural example of mark information.

Fig. 14 is an illustration showing a structural example of service use history information.

Fig. 15 depicts a flow chart describing a processing operation for displaying the top screen picture.

Fig. 16 depicts a flow chart describing the processing operation corresponding to a marking operation.

Fig. 17 depicts a flow chart describing a processing operation for displaying a list screen picture.

Fig. 18 depicts a flow chart describing a processing operation for renewing PV viewing history information.

Fig. 19 depicts a flow chart describing a processing operation for a cell display of a music gage area.

Fig. 20 depicts a flow chart describing an example of a

processing operation for providing a present service.

BEST MODE FOR CARRYING OUT THE INVENTION

Below, an embodiment of the present invention will be described. The description is carried out in the order as follows:

1. System Structure.
2. Digital Satellite Broadcast Receiver.
3. Example of Display and Operation of Content Screen Image
4. Structure of Broadcast Content
5. Structure of User-related Information
6. Processing Operation

1. System Structure

Fig. 1 shows a structure of the entire part of a digital satellite broadcast system corresponding to the present embodiment.

The content production system 106 shown in this drawing corresponds to the apparatus system producing contents that can be dealt in the present embodiment. The content production system 106 produces a program (content) broadcasted at a specific channel.

In the present embodiment, the content produced by the content production system 106 is defined such that the so-called promotion video of music is broadcasted as a main content.

Further, in broadcasting promotion videos, the promotion videos having hit chart rankings from first to hundredth places are successively broadcasted, wherein the rankings are renewed every week.

Further, in the present embodiment, the screen picture displayed on the reception side displaying this content is such that the moving picture as a promotion video is built in the GUI screen picture. More specifically, combining the promotion video with the GUI provides the content of the program in the present embodiment.

Further, to produce such a content, for example, it is assumed that contracts are made with a specific record company 109, a merchandise sale 107, and a concert ticket sales company 108. In addition, contracting companies such as the record company 109, the merchandise sales 107, and the concert ticket sales company 108 may exist in plural, respectively.

Here, the structure of the above-described content production system 106 will be simply illustrated in Fig. 2.

As shown in this drawing, the content production system 106 comprises, for example, a video/audio content registering system 111 and a GUI content production system 112.

The video/audio content registering system 111 registers video/audio data as promotion videos collected as materials from record companies 109 shown in Fig. 1. The registered video/audio data of the promotion videos is subjected to editing so as to be sequentially broadcasted in accordance with the

order of the hit chart rankings of from first to hundredth places and is transmitted to the ground station as video/audio contents of the promotion videos.

Further, the GUI content production system 112 produces a GUI content. The GUI content is content data for displaying on the reception side the GUI screen picture in which a moving picture as the above-described promotion video is set.

For example, there are various languages for describing such a GUI content (application). Here, BML (Broadcast Markup Language) belonging to an XML (Extensible Markup Language) is adopted. The XML is for describing script using tags as known and thus, the BML also follows this.

The GUI content production system 112 produces GUI content using the BML mentioned above so as to correspond to the above-described video/audio content. The production of such a GUI content is provided by application software such as the so-called script production tool or authoring tool, for example, on a personal computer. The GUI content produced, as described above, by the GUI content production system 112 is also transmitted to the ground station 101 similarly to the above-described video/audio content.

The description is returned to Fig. 1.

The ground station 101 transmits, as the same channel broadcast, the video/audio content and GUI content transmitted from the content production system 106 as mentioned above.

In the present embodiment, the data that serves as video/audio content and a typical broadcast program, is compressed-and-coded by the MPEG (Moving Picture Experts Group) 2 system and then transmitted.

Accordingly, in the ground station 101, the video/audio content transmitted from the content production system 106 is subjected to encoding by the MPEG2 system and then, compression coding. This provides compressed-and-coded video data and audio data from the video/audio content transmitted from the content production system 106. The compressed-and-coded video data and audio data and the GUI data transmitted from the content production system 106, similarly to the video data and audio data, are subjected to synthesizing by multiplexing, for example, so as to be included in one transport stream. Thus, the GUI data is dealt as the so-called data broadcasting in the digital satellite broadcast system.

The transponder obtained by synthesizing as mentioned above is subjected to processes such as the addition of error correction codes, modulation, and frequency conversion and then is transmitted to the satellite 102.

As described above, the signal transmitted from the ground station 101 is received by reception facilities 103 of respective homes through the satellite 102.

For the reception facility 103 of each home, a parabolic antenna 14, a digital satellite broadcast receiver 1, and a monitor apparatus 20 are prepared.

Further, in this case, a remote controller 13 for operating the digital satellite broadcast receiver 1 is indicated.

The signal broadcasted through the satellite 102 is received by the parabolic antenna 14. This reception signal is converted to have a predetermined frequency by an LNB (Low Noize Block Down Converter) mounted on the parabolic antenna 14.

The outlined operation of the digital satellite broadcast receiver 1 includes selecting a predetermined channel of signal (carrier) from the reception signal, demodulating the selected signal to obtain the video data and audio data as a program (video/audio content) to output the video signal and the audio signal. Further, the digital satellite broadcast reception apparatus 1 also performs reproduction display outputting for data broadcasting on the basis of the data (GUI content) as data broadcasting service multiplexed with the data of the program and transmitted. The output of such a digital satellite broadcast receiver 1 is supplied to, for example, a monitor apparatus 20. This provides picture display (including the picture of the data broadcasting) of the program of the channel selected by the digital satellite broadcast receiver 1 on the display screen picture 20A of the monitor apparatus 20. Further, an audio is outputted by a speaker or the like, which are assumed to be equipped on the side of the monitor apparatus 20.

The digital satellite broadcast receiver 1 is communicable with the accounting server 105 through, for example, a telephone line 104. At the digital satellite

broadcast receiver 1, if down-loading of, for example, audio data of music is carried out, the corresponding history data is stored on the side of the digital satellite broadcast receiver 1. The stored information is transmitted to the accounting server 105 through the telephone line 104 at a predetermined chance and timing. The accounting server 105 sets an amount of money in accordance with the transmitted history information to execute accounting to charge the user.

Further, it is connected also to a predetermined service server 110 through the telephone line 104. This provides connection with the service server 110 in response to the operation or the like to the GUI screen picture displayed, for example, on the side of the digital satellite broadcast receiver 1 for reception of the service provided by the service server 110. The service server may also be connected to plural ones at needs.

2. Digital Satellite Broadcast Receiver

Next, an example of the internal structure of the digital satellite broadcast receiver 1 equipped in the reception facility 103 in the above-mentioned digital satellite broadcast system will be described with reference to Fig. 3.

In Fig. 3, the parabolic antenna 14 shown in Fig. 1 is also shown. The parabolic antenna 14 receives the broadcast signal from the satellite 102 and converts it into a predetermined radio frequency signal with the built-in LNB (Low Noize Block Down Converter) to supply it to the digital satellite broadcast receiver 1.

The digital satellite broadcast receiver 1 is supplied with the reception signal received by the parabolic antenna 14 and converted to have the predetermined frequency by a front end section 2.

The front end section 2 receives the carrier (reception frequency) determined by a setting signal on the basis of the setting signal, in which transmission specifications or the like from the system controller 9 is set to obtain the TS (Transport Stream) by applying, for example, a Viterbi demodulation process, or an error correction process or the like thereto.

The TS according to the standard of this digital satellite broadcast is, as known, obtained by multiplexing compression data derived by compressing the video signal with various types of additional information, for example, by the MPEG2 (Moving Picture Experts Group Layer 2) system. Further, as describe above, the data for data broadcasting for data broadcasting service is multiplexed at need.

Further, the compression data derived by compressing the video signal and the audio signal, mentioned above, are multiplexed as an ES (Elementary Stream). Further, as the additional information inserted by the broadcast side, PSI (Program Specific Information: program specifying information) for storing tables such as the PAT (Program Association Table) and the PMT (Program Map Table), and the SI (Service Information: program arrangement information) are given.

The multiplexing of the above-mentioned various type of

information is carried out by storing the above-described ES and various types of additional information is stored such that the TS is made up of the transport stream packet (TS packet) of 188 bytes.

The TS obtained at the front end section 2 is supplied to a de-scrambler 3.

Further, the front end section 2 obtains a packet of PSI (Program Specific Information) from the TS to renew the selection station information as well as obtains a component PID (Program ID) of each channel in the TS to transmit it, for example, to the system controller 9. The system controller 9 utilizes the obtained PID in the reception signal processing.

The de-scrambler 3 receives a previously prepared de-scramble key data from the system controller 9 as well as the system controller 9 sets the PID there. Then, the de-scramble process is executed on the basis of the de-scramble key data and the PID.

Further, describing for confirmation, the TS outputted from the de-scrambler 3 may have a possibility that the ES of a plurality of programs are multiplexed. Further, the additional information including the data broadcasting data, and the PSI is multiplexed without removal.

The de-multiplexer 4 separates the necessary TS packet from the TS supplied from the de-scrambler 3 in accordance with the filter condition set by the system controller 9. Thus, for example, at the de-multiplexer 4, as the TS packets for one

target program, for example, the TS packet of the video data compressed by the MPEG2 system as a video program and the TS packet of the audio data compressed by the MPEG2 system, are obtained. Next, the compression video data and the compression audio data obtained as mentioned above is supplied to the MPEG decoder 5.

The de-multiplexer 4 separates the data broadcasting data of desired data broadcasting as a target and supplies it to the data production section 7 for data broadcasting.

Further, the individual packets of the compression video/audio data separated by the de-multiplexer 4 and inputted into the MPEG decoder 5 are supplied to the MPEG decoder 5 in the format called PES (Packetized Elementary Stream).

Further, the setting of the above-described filter condition is carried out by extracting the PAT, PMT, or like included in the TS, for example, in the de-multiplexer 4, and they are transmitted to the system controller 9. Next, the system controller 9 sets the filter condition to the de-multiplexer 4 on the basis of the details in the information described in the transmitted PAT and the PMT and the like.

The MPEG decoder 5 comprises a video decoder for executing a decoding (expansion) process for the compression video data in accordance with the MPEG2 format and an audio decoder for executing a decoding process for compression video data with synchronism with the above-mentioned video data output in accordance with the MPEG2 format. The inputted compression video data is subjected to the decoding process by

the video decoder and the inputted compression audio data is subjected to the decoder process by the audio decoder.

In this case, for example, the decoded video data is subjected to the predetermined signal process so as to be properly displayed in accordance with the predetermined television system such as an NTSC system to provide an output as a digital video signal.

Further, the decoded audio data is outputted, for example, as a digital audio signal.

In the present embodiment, the digital video signal and the digital audio signal outputted by the MPEG decoder 5 as mentioned above are inputted into the video/audio signal processing section 6.

The data production section 7 for data broadcasting is supplied with the packetized data broadcasting data, for example, in the TS packet format from the de-multiplexer 4. Then, the data production section 7 for broadcasting data executes the process for releasing the packetizing of the inputted TS packet or the like to generate the data broadcasting data. The data broadcasting data generated as mentioned above is written from the data production section 7 for data broadcasting on the memory 8 to be held there, for example, under the control of the system controller 9.

The memory 8 may be provided with the special one for holding the data broadcasting data or with a RAM or the like used by the system controller 9 as its work area.

The system controller 9 reads out the required data broadcasting data from the memory 8 to transmit it the video/audio signal processing section 6 in accordance with the timing when the data broadcasting data is to be displayed.

As a basic operation, the video/audio signal processing section 6 executes a predetermined signal process to the digital video signal and the digital audio signal of a video program inputted for the MPEG decoder 5 to output a video signal and an audio signal for display output.

If it is necessary to provide an output display of the data broadcasting, the video/audio signal processing section 6 converts the data broadcasting data inputted under control by the system controller 9 as mentioned above into screen picture data. After this, the data broadcasting screen picture data is superimposed on the picture of the digital video signal of the video program inputted from the side of the MPEG decoder 5. Then, the video signal on which the data broadcasting pictures superimposed as mentioned above is subjected to a predetermined signal processing for a display output similarly to the case mentioned above to output a video signal.

Further, if the data broadcasting is a BML content like the GUI content in the present embodiment, the BML content is reproduced to provide an output as follows:

The system controller 9 according to the present embodiment has a function as the BML decoder 9a as shown in the drawing in accordance with the program stored in the ROM

11. If the data for data broadcasting generated at the data production section 7 for data broadcasting is a BML content, the system controller 9 reads out the script described as the BML content, and the BML decoder 9a interprets the description details of the script. Then, according to the description in the script, for example, the video/audio signal processing section 6 can be controlled.

At the video/audio signal processing section 6 generate a GUI screen picture is produced using, for example, entities (objects) such as the text (document) or a button held in the memory 8 as the BML content under the control by the system controller 9. The GUI screen picture is outputted as a video signal.

The system controller 9 executes various control processes to obtain predetermined operations in the digital satellite broadcast receiver 1 as understood from the description mentioned above. The system controller 9 comprises, for example, a CPU (Central Processing Unit) or the like and, as shown in drawing, further comprises a ROM 11 and a RAM 12. The ROM 11 stores the programs to be executed by the system controller 9 including the BML decoder 9a and various types of initial setting information. Further, the ROM 11 according to the present embodiment comprises a non-volatile memory element writable to hold the data memory, for example a flash memory or the like though the supply power stops. Then, on the rejoin of this non-volatile memory, for example, user related information, which will be mentioned later is stored.

Further, at the digital satellite broadcast receiver 1, a

remote controller 13 as a separate body is provided. This remote controller 13 has various operating elements for operating the digital satellite broadcast receiver 1. Then, the command signals corresponding to the operations carried out. Next, a commend signal corresponding to the operation executed to these operating elements are wirelessly transmitted by, for example, an infrared ray or a radio wave.

The command signal wirelessly transmitted is received by the reception section 10 provided to the digital satellite broadcast receiver 1 which is supplied to the system controller 9 as an operation command. The system controller 9 executes a predetermined control process to obtain the operation corresponding to the input operation command.

3. Content Screen Picture Display and an Example of Operation

When the digital satellite broadcast receiver 1 having the structure shown in Fig. 3 mentioned above receives the program (also referred to as PV (Promotion Video) content) made up of the video/audio contents and GUI content produced by the content production system 106 previously shown in Fig. 1, the picture and audio as this content is outputted.

Further, as mentioned earlier, the PV content according to the present embodiment is displayed such that the video/audio content as promotion video is set in the GUI screen picture. The user can have various operations to the GUI screen picture.

Then, will be described an example of displaying the GUI

screen picture of the PV content and an example of the operation to the GUI screen picture.

Fig. 4 illustrates an example of a displaying condition of a top screen picture 200 that is initially displayed on the display screen 20A of the monitor apparatus 20, for example, if the channel of the PV content of the present embodiment is received.

Further, in the description below, various buttons on the top screen picture will be described. These buttons are first operated by operation of the upward, the lowered, the leftward, and the rightward keys on the remote controller 13. Thus, in response to the operation the upward, the lowered, the leftward, and the rightward keys, the active key shifts upward, downward and leftward and rightward among these buttons arranged on the screen picture. When the target button is made active, the operation of the decision key corresponds to the operation of the button.

The top screen picture 200 shown in this drawing, on the main screen picture area 201, the screen picture of the promotion video that is the video/audio content is displayed as a moving picture. Here, in the condition that the moving picture is displayed on the main screen picture area 201, the audio of the music or the like synchronizing with the displayed picture is also in the outputted condition.

Further, at the lower left of the main screen picture area 201, a title area 202 and an artist name area 203 are displayed. Conventionally, the title or the artist name in the promotion

video was displayed as characters superimposed on the screen picture of the promotion video. Further the title/artist name by superimposing was frequently displayed only at the start and end parts of the music of the promotion video, and thus, it cannot be seen at the intermediate part of the music.

On the other hand, in the present embodiment, the title area 202 and the artist name area 203 provide continuous displaying there at different areas from the main screen picture. Thus, if the music is played as the promotion video, the user can know the title and the artist of the music anytime by watching the title area 202 and the artist name area 203.

Further, as mentioned above, the PV content according to the present embodiment, the promotion video of music having hit chart rankings of first to hundredth are sequentially broadcasted. Thus, the promotion videos change at the unit of music as passage of time.

In the present embodiment, as the music of the promotion video changes, the titles at the title area 202 and the artist name at the artist name area 203 also automatically change.

The change of the display mentioned above is provided by the execution of the process by the system controller 9 (BML decoder 9a) in accordance with the script as the GUI content.

For example, some script of the GUI content describes an instruction for, if the promotion video (music) at the main screen picture area 201 changes, displaying the title and artist names at the title area 202 and the artist name area 203

corresponding to the switched promotion video.

In accordance with the description, the BML decoder 9a reads out the information of the title and artist names corresponding to the switched promotion video out of the titles and artist names held as entities (object, external reference file or the like), for example, in the memory 8. Then, the generation process of the GUI screen picture at the video/audio signal processing section 6 is controlled so as to display the read title and artist names at the title area 202 and the artist name area 203.

Further, at the left side of the main screen picture area 201, a music gage area 204 is arranged.

The music gage area 204 provides a graphical display indicating as to which music's promotion videos have been viewed therethrough, out of the promotion videos having rankings of the first to the hundredth places as viewing history of the PV contents by the user. This point will be described with reference to Figs. 5A to 5D.

Here, it is assumed that there is no promotion video of which music is viewed from the start to the end of the music therethrough. In this case, nothing is displayed in the entire part of the music gage area 204, i.e., the same color as the background is displayed there. Fig. 5A schematically shows this condition.

As shown in Fig. 5A, the music gage area 204 is, in fact, a display region made up of arranged cells 20. There are a

hundred of cells 204a having a matrix of 5 (horizontal) x 20 (vertical). Each of cells 204a corresponds, for example, to the order of the promotion videos having rankings from the first to hundredth places in accordance with the arrangement order as shown.

Here, in this condition, it is assumed that the user views the promotion video having the third ranking from the start to the end thereof at the first time. Then, in accordance with the viewing history, the cell 204a corresponding to the third ranking is, as shown in Fig. 5B, displayed, wherein the cell is fully painted with a predetermined color.

Further, after this, if it is assumed that the user views the promotion videos having rankings of the tenth, nineteenth, and twenty-sixth places from their starts to the ends, in accordance with this, the cells 204a corresponding to rankings of the tenth, nineteenth, and twenty-sixth places are, as shown in Fig. 5C, displayed with a predetermined color(s).

If, for example, the user further views the promotion videos having other rankings from their starts to the ends, the cells 204a are sequentially displayed with a predetermined color correspondingly to the rankings of the viewed promotion videos. Finally, if all promotion videos having the rankings of the first to hundredth places are viewed therethrough, as shown in Fig. 5D, all cells 204a are displayed with predetermined colors, respectively.

Here, the cells 204a may have the same color. However, in the present embodiment, if all cells 204a are displayed, the

entire part of the music gage area 204 indicates a picture pattern or characters or the like in accordance with a predetermined design.

This provides visual interesting to the user. Further, it is supposed that some user desires to complete the picture pattern on the music gage area 204 by viewing more promotion videos having different rankings therethrough. This may make the user more view the promotion videos.

Here, the display of the cells 204a at the music gage area 204 as described is also provided by the execution of the script in the GUI content by the BML decoder 9a. However, this processing operation will be described later.

Further, in the present embodiment, for example, as described above, the entry button 213 is firstly displayed if a user has viewed all promotion videos having rankings of the first to hundredth places therethrough, and thereby the picture pattern at the music gate area 204 is completed. Also this display is, which will be mentioned later, provided by the process of the BML decoder 9a on the basis of the script of the GUI content.

When the entry button 213 displayed as mentioned above is operated, for example, the display is changed to the screen picture for entry for a present at the same reception channel by the control according to the script. The user can enter for a present by the predetermined operation toward the screen picture of entry for a present. The information of entry for a present is, for example, transmitted to the service server 110

(refer to Fig. 1) providing the entry for a present through the telephone line 104.

That is, in this case, if a user views all promotion videos having the rankings of the first to hundredth places therethrough, the user is supplied with the right of entry for a present as a reward. This increases characteristic of entertainment and additional value.

Further, under the title area 202 and the artist name area 203, there are provided areas where color buttons are arranged including a blue button 205, a red button 206, a green button 207, and a yellow button 208.

The indications of these color buttons correspond, for example, to the color buttons (blue, red, green, yellow) actually provided on the remote controller 13. That is, the operation of the blue button as a color button on the remote controller corresponds to the operation of the blue button 205 on the screen. Thus, the operation of these color buttons (the blue button 205, the red button 206, the green button 207, and the yellow button 208) requires no operation of the upward, downward, leftward, and rightward keys, and the decision key unlike other buttons.

In the present embodiment, the color buttons (the blue button 205, the red button 206, the green button 207, and the yellow button 208) are provided with functions as follows:

The blue button 205 functions as one for marking. For example, if it is assumed that the user viewing a promotion

video on the top screen 200 and prefers it. In this case, the user can do marking by operating the blue button on the remote controller 13. According to this, the music of the promotion video displayed on the main screen picture area 201 is registered on the side of the digital satellite broadcast receiver 1 as the music marked as a favorite. Here, in accordance with registering as mentioned above, the check box 209 for making above the blue button 205 is marked with a check mark as shown. For example, after this, if the promotion video of the music is broadcasted again, the check mark is automatically displayed.

Further, for example, if the picture displayed at the main screen picture area 201 is for a commercial message or the like, which is other than the promotion video, the "Mark" displayed above the blue button 205 is not displayed, so that the operation of the blue button 205 is dealt as invalidation.

Further, the red button 206 functions as a button for displaying a list screen picture. When the user operates the red button 206, for example, the list screen picture 250 shown in Fig. 6 is displayed.

The list picture 250 shown in Fig. 6 displays the list of the promotion videos (music) registered up to now by the marking operations mentioned above by the user, and the list of the music is displayed at the list display area 251. Here, correspondingly to the display of the list of the marked music, a tag for the list display area 251 locations at the "marked music" button 254 arranged at the lower right of the list display area 251.

At the list display area 251, five areas including music information areas 252-1 to 252-5 are displayed. In these music information areas 252-1 to 252-5, titles and artist names of music are displayed, respectively. Further, the order of hit chart rankings is displayed by alphanumerical indication. Furthermore, check boxes 253 are provided to the insides of the music information areas 252-1 to 252-5, respectively. The check at the check box indicates that the user marked the music.

Here, the user can cancel the check displayed at the check box 253 by operation to the remote controller 13. This provides release of the registration of the music intentionally marked by the user afterward. In addition, the operation for attaching, again, the check released on the screen is also possible.

Further, there are provided a page return button 258, and page advance button 259 at the upper and lower locations within the list display area 251, respectively. The operation of these buttons can change the page of the list of the music displayed within the list display area 251, like pages are turned over.

Furthermore, at the lower left side of the list display area 251, the main picture area 201a is displayed at a small area to show the content of the video/audio content currently broadcasted. In addition, correspondingly to the main screen picture area 201a, the colors buttons (the blue button 205, the read button 206, the green button 207, and the yellow button 208) are displayed above the main screen picture area 201a. In this case, the blue button 205 is effective and thus, provides the

marking operation.

Furthermore, the operation of the "To Top screen" button 257 returns the screen picture to the top screen picture 200 shown in Fig. 4.

Further, will be described later the case of the operation of the "To CD/DVD Shopping" button 256 on the immediately right of the "To Top screen" button 257.

For example, in the condition of the list display of the marked music shown in this Fig. 6, it is assumed that the "all music" button 255 below the list display area 251 is operated. This results in the display transient to the list screen picture 250 displaying a list of all of music having the first to hundredth rankings. Fig. 7 illustrates this list screen picture 250.

The display condition of the entire part of the list screen picture 250 shown in Fig. 7 is the same as the list screen picture 250 previously shown in Fig. 6.

However, in this case, correspondingly to list-displaying all music, the tag of the list display area 251 is provided to "all music" button 255.

In addition, within the music information areas 252-1 to 252-5, titles and artist names of music are displayed and arranged in accordance with the order of rankings. Here, also on this screen picture, the registration of music as a newly marked music by attaching a check to a check box 253 within

the music information areas 252-1 to 252-5 or the release of the registration by removing the check can be done.

In condition that the list screen picture 250 shown in Fig. 6 or 7 mentioned above is displayed, the operation of the "To CD/DVD Shopping" button 256 displays the guidance screen picture for shopping (not shown). Then, the operation of the button for advancing from the shopping guidance screen picture to the next changes the display of the merchandize selection screen picture 300 shown in Fig. 8.

The merchandize selection screen picture 300 shown in Fig. 8 is displayed for decision of the merchandize to buy as a screen picture for procedure of buying a CD or DVD as a merchandize relating to the music of which marking is registered.

Within the window of the merchandize selection screen picture 300, at the uppermost, a marked music display area 301 is arranged where the title, the artist name, and the ranking of one piece of the marked music are displayed.

Under this, a signal CD button 302, an album CD button 303, and a DVD button 304 are arranged. At the single CD button 302, the album CD button 303, and the DVD button 304, contents of the CDs, the album CDs, and the DVDs to be indicated in accordance with the title of the music displayed at the marked music display area 301 are displayed, respectively. The user operates the button corresponding to one that the user desires to buy with reference to the display of these buttons. In response to this operation, a check is attached to a check box

displayed within a cage type of buttons, respectively, to indicate the candidate determined by the user. Further, the operation of the button to which a check is attached at the cage type of check box 311 removes the check to cancel the decision of the buying candidate.

Further, if the user desires to view the CD or the DVD of which music has been marked, the user operates the right shifting button 305 and a left shifting button 306 at the rightmost and the leftmost of the window, respectively. This indicates the information of the CD or the DVD including another marked music as the page changes in the direction of the left and the right.

For example, after attaching a check for the CD or the DVD which the user desired to buy, the operation of the "To Next" button 310 at the lower left of the screen advances the screen picture to the buying procedure screen picture. For example, the displayed picture advances to the user selection screen picture 350 with reference to Fig. 9 mentioned later. On the other hand, the operation of the adjacent "Return" button 309 returns the screen picture to that for the shopping guide.

Furthermore, the operation of the "Buying Procedure Canceling" button 308 cancels the procedure of buying and returns the screen picture, for example, to the list screen picture 250 shown in Fig. 6 or 7.

Further, the operation of "Guide to Use" button 307 changes the display picture to the screen picture of guide to use

(not shown).

Further, also in this screen picture, the screen picture of the current video/audio content is displayed at the main screen picture area 201a at the small display area.

As described above, if the user operates the "Next" button 310 on the merchandize selection screen picture 300 in Fig. 8, the user selection screen picture 350 shown in Fig. 9 is displayed.

In the user selection screen picture 350 shown in Fig. 9, within the window, the user buttons 351 are displayed. At the user buttons 351, there are shown names of the users of which private information has been registered. The operation of the user button 351 results in selection of the user intending to use the service such as shopping.

When the user buys a CD or a DVD, and if the user buys a merchandize using the merchandize buying service by the operation to the digital satellite broadcast receiver 1, it is necessary to previously register by storing user's private information (the address, the name, the age, the date of birth, the credit number, or the like) in the digital satellite broadcast receiver 1. Then, the procedure of buying is executed using the registered private information.

In this user selection screen picture 350, the execution of the user selection with the above-mentioned user button 351 means to select the private information necessary for buying.

When private information is newly registered, the resister button 352 is depressed. Although the detailed description is omitted, this changes the screen picture to that of input screen picture for registering the private information. The operation of inputting predetermined private information items on the following screen picture registers the private information.

Further, the "Next" button 353 outside the window shifts the screen picture to that for the next buying procedure. The operation of the "Return" 354 shifts the screen picture to that for the merchandize selection as shown in Fig. 8.

In this case, the operation of the "Buying procedure canceling button 355 cancels the buying procedure up to now and returns the screen picture, for example, to the previous list screen picture 250 shown in Fig. 6 or 7. Also in this display screen picture, the picture of the current video/audio content is displayed at the main screen picture area 201a with a small display area.

Further, the change of the screen picture in accordance with the operation as described with the above-mentioned Fig. 4 and Figs. 6 to 9 is provided by the execution of the process by the system controller 9 (BML decoder 9s) in accordance with the script of the GUI content. That is, in the GUI content, there is provided data and script for various entities for displaying the GUI display screen pictures shown in respective drawings as well as in each GUI display picture, there are set links for button operations in accordance with the script. In response to the button operation, the processing jumps to the

location to which the link is set, so that the action occurs to change the display screen picture to that to be displayed.

Returning to the top display screen picture 200 in Fig. 4, the yellow button 208 as a color button is provided for shifting the display screen picture to that for ticket information providing or ticket buying services. Here, the yellow button 208 is effective only if the artist, of which the promotion video currently displayed on the main display screen picture area 201, provides concert tickets to the ticket sales company 108. If the ticket becomes invalid, for example, the characters "Ticket" above the yellow button 208 is not displayed, and the operation of the yellow button 208 is dealt as invalid.

Further, no function is currently assigned to the green button 207.

Further, on the top display screen picture 200, the operation of the program jump button 210 displayed at the lower right of the main display screen picture area 201 changes the station to other music cleared channel contracting with the broadcast of this PV content.

Further, on the top display screen picture 200 shown in Fig. 4, a banner commercial message button 211 and an information button 212 are displayed. At the banner commercial message button 211, a banner commercial message is displayed. The operation of this banner commercial message button 211 changes the GUI display screen picture to that for providing a service corresponding to the content of this commercial message. The operation of the information button

212 changes the display screen picture to the GUI display screen picture as an information display screen picture illustrating a list of various services.

Here, the features of the present embodiment included in the above description will be described for arrangement thereof.

[First Feature]

It can be said that because the video/audio contents according to the present embodiment are, as same as the conventional ones, promotion videos broadcasted by the general broadcast, they have the feature that its content itself (music) changes with the passage of time.

Further, in the present embodiment, the GUI display screen picture relating to the video/audio contents automatically change so as to be adapted to the content change of such the video/audio content . Thus, the digital satellite broadcast receiver 1 carries out the control on the basis of the script.

This corresponds to the change in title and artist name displayed at the title area 202 and the artiest name area 203 on the top display screen picture 200 in Fig. 4 in accordance with the music of the promotion video.

Further, it corresponds to that the mark of the blue button 205 is invalid if the promotion video is not displayed on the main screen picture display area because of displaying a commercial message or the like.

Further, in the same top display screen picture 200 shown in Fig. 4, the conditions of the color buttons (the blue button 205, the red button 206, the green button 207, and the yellow button 208) change in valid/invalid. This corresponds to it. In other words, regarding the artist of which promotion video is currently reproduced on the main screen picture area 201, the yellow button 208 is effective only if a ticket sales company 108 supplies the concert ticket. This also corresponds to it.

Further, in accordance with the change of the promotion video displayed on the main display area 201, the check condition varies on the check box 209 for marking with reflection of the result of the previous mark operations. This also corresponds to it.

That is, the first feature is that the video/audio content that is a broadcast content of which content itself changes with the passage of time of the broadcast content is defined as a trigger (origin). In addition, the GUI screen picture having a predetermined display content regarding this video/audio content is displayed with the video/audio content, wherein the display content of the GUI screen picture is adaptively varied in accordance with the variation of the content of video/audio content.

For example, conventionally, if additional information corresponding to the main broadcast program is displayed, and the content of the additional information is tried to be changed with the variation of the content of the main broadcast program, it was set in the video signal of the main broadcast program as

superimposing.

On the other hand, according to the present embodiment, on the side of the GUI screen picture independent of the video/audio content corresponding to the main broadcast program, the variation of the display content corresponding to the content of the broadcast can be obtained. Further, to obtain such a content variation, for example, it was not executed to sequentially change the content of the data broadcasting in accordance with the variation of the content of the main broadcast content. In other words, it is acquired in accordance with the scripts of the GUI content that has been received as the data broadcasting. This means that it is executed such that the display variation of the GUI screen picture in accordance with the content of the main program is completed at the digital satellite receiver 1 that is on the reception side.

This eliminates the necessity of always, instantaneously changing the content of the data broadcasting in accordance with the variation in the main program, for example, on the broadcast side. Thus, it is sufficient that the broadcast side only prepares one GUI content correspondingly to the successive program content. Specifically, in the present embodiment, the video/audio content, as the main program, is provided by repeatedly broadcasting the promotion videos of music having hit rankings of the first to hundredth places. Thus, there are a hundred of patterns in the variation of the content. Therefore, it is very easy to prepare one GUI content in accordance with the content of the broadcast.

From this, the present embodiment can prepare such a program that variation in the display content of the GUI screen picture is efficiently given with reduction in the load for the work of producing the program. Further, it increases the entertaining characteristic and the convenience for the users.

[Second Feature]

Further, according to the description about the top screen picture 200 shown in Fig. 4, the user can execute the marking operation for the favorite one with viewing the video/audio content. Then, in accordance with the marking result, the content of the list of the marked music shown in Fig. 6 varies. That is, the display of the GUI screen picture as the list screen picture 250 varies in accordance with the marking operation.

Further, as shown in Fig. 8, in accordance with the result of the marking operation, regarding the target of the CD/DVD shopping, the merchandize selection screen picture 300 is formed only for the marked music and then, outputted to display it.

These display content variations means that the digital satellite broadcast receiver 1 executes the display control in accordance with the script of the GUI content so as to change the display of the GUI screen picture in accordance with the behavior that the user operates for the video/audio content as a direct target.

Further, regarding the display variation on the music gage area 204 on the top screen picture 200 (Figs. 5A to 5D),

the user carries out no special direct operation for the music gage area 204. However, the display condition of the music gage area 204 is changed by the user's behavior in which the user responds to the video/audio content as a target, that is, the user views the promotion video.

Also in this case, the digital satellite broadcast receiver 1 carried out the display control in accordance with the script so as to change the display of the GUI screen picture in accordance with the user's behavior of "viewing" the target of the video/audio content.

The second feature may be summarized as follows:

The user performs some behavior toward the broadcast content (video/audio content) having a characteristic in which the content itself varies with the passage of time irrespective of the presence of or absence of the operation. In addition, in response to the user's behavior (on the basis of the user's operation or the history of viewing), the digital satellite broadcast receiver according to the present embodiment controls to change the display content of the GUI screen picture relating to the video/audio content in accordance with the scripts of the GUI content.

For example, changing the content of a content is varied in accordance with the user's behavior (actions) is also carried out, for example, in Web pages. However, in this case, for example, the server reads a cookie or the like, or the side of the server acquires the access history in some manner to re-structure the content of the web page to be transmitted. In

other words, there is always an external server or an administrator.

On the other hand, in the present embodiment, once the side of the digital satellite broadcast receiver 1 stores history information (which will be mentioned later), the digital satellite broadcast receiver 1 executes the process so as to change the display of the GUI screen picture adaptively to the above-mentioned history information in accordance with the script of the GUI content. In other words, in this respect, like the first feature, the variation in display of the GUI screen picture in accordance with the content of the main program is executed so as to conclude at the digital satellite broadcast receiver 1 as the receiving side.

[Third Feature]

Further, at the merchandize selection screen picture 300 described with reference to Fig. 8, the represented merchandizes of CDs and DVDs relate to the music to which the user has applied the marking operation.

Furthermore, as described with reference to Figs. 4 and 5A to 5D, the user is provided with the right for entry for a present by displaying the entry button 213 within the top screen picture 200, if the user viewed all pieces of music having rankings of the first to hundredth places therethrough to display all cells 204a at the music gage area 204.

For example, as described above, displaying the GUI screen picture provided to purchase CDs and DVDs and

providing the right for entry by displaying the entry button 213 for entry for a present means providing the user with some service using the GUI screen picture. Further, any of the above-described service providing is made on the basis of the history of the previous use of the digital satellite broadcast receiver 1.

In other words, in the third feature, the service content to be served is changed on the history of the use of the digital satellite broadcast receiver 1 regarding the user.

Also in this case, such a change of the service is provided by storing the history on the side of the digital satellite broadcast receiver 1 and then, executing the process for changing the GUI screen picture display adaptively to the above-described history information in accordance with the script of the GUI content.

In other words, the change of the provided service is also carried out without intervening of a server, but with completion on the side of the digital satellite broadcast receiver 1.

4. Structure of Broadcast Content

Hereinbelow will be described the structure for providing the first to third features mentioned above. The operation as described above is provided with the script of the GUI content transmitted together with the video/audio content as data broadcasting. However, the broadcast content according to the present embodiment can conceptually be shown by the structure indicated in Fig. 10.

More specifically, as shown in Fig. 10, a broadcast content includes video/audio contents 400 as promotion videos at a unit of a piece of music. In this case, the video/audio content 400 includes video data and audio data as a unit of one piece of music. Further, in the case of the present embodiment, a hundred of video/audio contents 400 corresponding to the list chart ranking of the first to hundredth places are prepared and are edited to be sequentially, repeatedly transmitted.

To the digital satellite broadcast receiver 1, as described earlier, the video data and the audio data that is the video/audio content 400 is compressed-and-coded by the MPEG2 system and then transmitted.

Further, these video/audio contents 400 are made to have a corresponding relation, for example, with at least one GUI content 401. Further, the GUI content 401 is transmitted as the above-mentioned video/audio content together with the general broadcast as data broadcasting at the same channel.

Furthermore, the GUI content 401 comprises, for example, as shown in the drawing, the script 402 and, for example, an entity 403 for a document, and an entity 404 of a screen picture.

The script 402 is described with tags in the known manner, wherein the execution of the process according to the script provides the operations of displaying described with reference, for example, to Figs. 4 to 9 and providing services.

In addition, the entities 403 and 404 include, for example,

files as a part of data with a tag in the script. Further, it includes a text to which an XML document refers and a picture or the like that is not a file the XML format. For example, in the case of the present embodiment, there exist, as entities, various character stream information and picture files such as buttons and the background forming GUI screen pictures as shown in Figs. 4 to 9.

Further, the execution of a drawing process using these entities in accordance with the description of the script 402 forms the GUI screen pictures shown in Figs. 4 to 9 and provides a display output. In addition, this provides the change of the display content on the GUI screen picture and switching the GUI screen picture.

5. Structure of User related Information

As earlier described as the second and third features, in order to carry out the change or the like of the display content or the provided service in accordance with the history of the user's use, in the digital satellite broadcast receiver 1, such information about the history of the user's use should be stored. This information is included in the user related information 11a stored in the ROM 11 as shown in Fig. 3.

The whole of the structure of the user related information 11a is one shown, for example, in Fig. 11.

As shown in Fig. 11, the user related information 11a comprises user's private information of each user and user's use history information of each user.

In a piece of user's private information, as described with reference to Fig. 9, the information is stored about information about the user who has been registered as a user (the address, the name, the age, the credit number, and the personal identification number or the like). Then, in the user's private information, the number corresponding to the number of the registered users is stored.

Because the user who has done registration should be provided with a user ID, the user ID is also stored to identify which user corresponds to the user's private information.

The user's use history information is provided for each user who has executed the registration, and predetermined history information obtained by the user's use of the digital satellite broadcast receiver 1 is stored therein.

In one piece of the user's history information, first, a user ID is stored to identify which user corresponds to the user's history information. In this case, PV viewing history information A1, marking information A2, and the service use history information A3 is stored.

The structure of the PV viewing history information A1 is shown, for example, in Fig. 12.

As shown in Fig. 12, the PV viewing history information A1 has the structure that information pairs of the content ID and the number of times of viewing correspond to the ranking order. In this case, the content ID is one for the video/audio

content. That is, a content ID is added to each of unit of music broadcasted as a promotion video. Here, as an example, it is represented in a hexadecimal notation by xxxxh, as shown in the drawing.

As the PV viewing history information A1 having such a structure, content IDs attached, for example, to a hundred of promotion videos currently broadcasted are stored correspondingly to current rankings from the first to the hundreds, respectively.

The number of times of viewing in this case represents the number of times of viewing and listening music through promotion videos.

Thus, the reference to the content of the PV viewing history information A1 provides identification as to which promotion videos (music) have been viewed therethrough and their the number of times of viewing, out of the hundred of promotion videos currently broadcasted.

Fig. 13 illustrates a structure of the marking information A2.

The marking information, like the case of Fig. 12, has a structure in which correspondence is provided between the ranking order and the content IDs that correspond to mark bits, respectively.

For example, the mark bit is set "1" if the making operation is effected to the promotion video (music) having the

corresponding content ID. In the case that no mark is set or the mark is released, the mark bit is set "0".

The reference to the marking information A2 provides the recognition as to which promotion videos (music) are currently marked as the result of the marking operation described with reference to Fig. 4 or the like.

Fig. 14 illustrates a structure of the service use history information A3.

The service use history information A3 as shown is constructed to have correspondence between the service IDs and the use dates.

The service ID is an ID provided for each service that can be provided with the GUI screen pictures displayed by the GUI content according to the present embodiment and is included in the structure of the GUI content.

When a user uses some service, for example, by operation toward the GUI screen picture, the service ID indicative of the used service is provided with correspondence with the information of the use date, and then, the service ID and the information of the use date is stored.

The reference to the service use history information A3 provides the recognition as to when and what service was used. In this structure, there may be a case that the same service ID is stored at different use dates. Thus, the recognition of the number of the same service IDs provides the recognition of the

number of times of use of each service.

6. Processing Operation

Next, various processing operations executed by the function of the system controller 9 as the BML decoder 9a in accordance with the script 401 of a GUI content will be described with reference to flow charts in Figs. 15 to 20.

First, Fig. 15 describes a processing operation to display the top screen picture 200. The system controller 9 waits for the newly acquired GUI content in step S101. For example, if regarding a reception channel, switching is done to the channel of the PV content according to the present embodiment, and if the rankings are changed, a new GUI content is received and achieved. Further, if it is judged that a new GUI content is received and acquired due to the start of broadcast of the new GUI content as mentioned above, the processing proceeds to the process in step S102.

In step S102, the script 402, included in the receiving and acquired GUI content, is read, and the script is interpreted. In the next step S103, the video/audio signal processing section is controlled to generate the top screen picture 200 in accordance with the description of the script recognized by the above-mentioned analysis.

In the top screen picture 200 generated as mentioned above, though a detailed description about process is omitted, for example, as described with reference to Fig. 4, the cells 204a are displayed in the music gage area 204 reflecting the

promotion videos that have been viewed therethrough by the user. Further, in accordance with the content of the content displayed within the current main screen picture area 201, the GUI screen picture in which the validation/invalidation is set regarding the color buttons such as the blue button 205 and the yellow button 8 are formed.

Next, the picture of top screen picture 200 generated as mentioned above is outputted as a video output by the process in step S104. This provides the display output by means of the picture, for example, using the monitor apparatus 20.

Specifically, the display control of the cells 204a on the music gage area 204 executed in the generation process of the top screen picture 200 in step S103 will be described later with reference to Fig. 19.

Next, with reference to Fig. 16, will be described the process corresponding to the marking operation by the user.

The system controller 9 waits for the marking operation in step S201, and proceeds to step S202 if it is judged that the marking operation has been done.

In step S202, the content ID corresponding to the promotion video (music) currently displayed (currently received) on the main screen picture area 201 is recognized.

There are some possible devices for acquiring the content ID, for example, it can be done in the follow ways:

For example, the content ID is superimposed on broadcast data and then transmitted from the broadcast side as one piece of additional information for each video/audio content as a promotion video (music). In the digital satellite broadcast receiver 1, it is sufficient to hold the received and acquired content ID extracted from the broadcast signal in the RAM 12 together, for example, with other additional information. Then, the content ID held in the RAM 12 is read if the process in step S202 is to be executed. This provides recognition.

The ROM 11 memories and holds the user related information 11a, and at the user's use history information in the user related information 11a, the marking information A2 is stored. In the next step S203, in the making information the mark bit corresponding to the content IC recognized in step S202 mentioned above is set "1".

In the present embodiment, the user's use history information storing the marking information A2 is prepared for each registered user. Then, in the present embodiment, first, the user ID of which user is currently set as the user of the digital satellite broadcast receiver 1 is recognized and then, the mark bit is rewritten in the marking information within the user's use information in which the recognized user ID is recorded.

Further, it may be considered that the marking information is common to users. However, in this case, the recognition of the user of the user as mentioned above is unnecessary.

Here, to display the top screen picture 200, the process in the following step S204 executes the display control for displaying the check in the check box 209 for marking on the top screen picture 200.

Next, with reference to Fig. 17, will be described the processing operation to start the display of the list screen picture 250 shown in Figs. 6 and 7.

In the process shown in Fig. 17, first, in step S301, it is judged as to whether it is to start the display of the list screen picture 250 of the marked music is to be started. The processing proceeds to the process after step S303 inclusive, if an affirmative result is obtained due to the jump to a location where a link is set, for example, if the read button for displaying the list screen picture on the top screen picture 200 on Fig. 4 is operated, if the "marked music" button 254 on the list screen picture 250 shown in Figs. 6 and 7 is operated, or if an operation for a return from another GUI screen picture to the list screen picture 250 of the marked list screen picture 250.

On the other hand, if the above-mentioned operation is not executed, a denial result is provided, and the processing proceeds to step S302.

In step S302, it is judged whether the list screen picture display for all music is to be started or not, in step S302. The processing proceeds to the process after step S306 inclusively if an affirmative result is obtained due to the jumps to the set link in response, for example, to the operation of “All music” button

254, the operation causing return to the list screen picture 250 of all music from other GUI screen pictures, or the like.

In step S303, the marking information within the user's use history information indicated by the user ID of the user set as the current user, is read out from the user's use history information 11a in the ROM 11. Next, the content ID having a mark bit of "1" is obtained from the marking information subjected to the reading, and then, held in the RAM 12.

Here, the GUI content is one holding a music information list, as an entity, that is information about promotion videos of hundreds pieces of music currently broadcasted for the current period, and the music information list is held in the RAM 12.

In step S304, out of the above-described music information list, only the music information corresponding to the content ID obtained in the above-described step S303 is read out. Next, in the following step S305, a picture is generated as the list screen picture 250 of the marked music shown in Fig. 6 using the read music information. During this, the content of the read music information is reflected as the ranking order within the music information areas 252-1 to 252-5, titles, and artist names. Further, as the drawing process, checks are attached to all the check boxes 253.

The generated screen picture as mentioned is outputted as a video output by the process in step S309, so that it is displayed on the monitor apparatus 20 or the like as a screen picture.

On the other hand, if the processing proceeds to step S306 because the list screen picture 250 for all music is to be displayed, the processing is as follows:

In step S306, the content ID having a mark bit of "1" is obtained by the process similar to the step S303.

In this case, in the following step S307, as described earlier, all the music information is read out from the music information list held in the RAM 12. Next, the process in the following step S308 generates a picture as the list screen picture 250 for all music shown in Fig. 7 using the read music information. During this, the content of the read music information reflects the ranking order, the title, and the artist name within the music information areas 252-1 to 252-5. Further, if a check is attached to each check box 253 within the music information areas 252-1 to 252-5, it is recognized whether the mark bit corresponding to the content ID corresponding to the music to be displayed at the music information areas 252-1 to 252-5 is "1" or "0" with reference to the making information again. The check mark is attached only to the music having the mark bit of "1".

As described above, the generated picture is also outputted as the video output by the process in step S309.

Fig. 18 illustrates the processing operation for renewing the PV viewing history information A1 within the user's use history information in the user related information 11a. The PV viewing history information A1 indicates the history regarding that the user viewed the promotion videos

therethrough.

As shown in the drawing, the system controller 9 judges, first, in step S401, as to whether the display of a new promotion video (music) is started. The change of the promotion videos (music) currently displayed can be recognized, for example, by monitoring the change of the content ID transmitted as additional information together with the video/audio data as the promotion video (music). When the content ID changes, and it is judged that the display of the new promotion video is started, the processing proceeds to step S402.

In the process in step S402, it is judged whether the promotion video has completed (music), the display of which is started correspondingly to the process in the above-described step S401.

If the promotion video (music) has not completed, it is judged, in step S403, whether the processing transients to another screen picture. Another screen picture, here, includes, for example, the case that switching to another channel is done. Further, though the channel is unchanged, this includes, for example, the case that it does not become dealt as viewing a promotion video due to transmission to anther predetermined GUI screen picture.

In step S402, if an affirmative result is obtained, the process shown in this drawing is completed and the processing proceeds to another desired processing routine. On the other hand, if there is no switching to another screen picture, the processing returns to the process in step S402.

Thus, in step S402, an affirmative result can be obtained if the currently broadcasted promotion video is displayed from the start to the end thereof without transition to another screen picture at an intermediate point. If the affirmative result can be obtained as mentioned above, the processing proceeds to step S404.

Here, the fact that the affirmative result can be obtained corresponds to the fact that the user views the promotion video currently broadcasted therethrough.

In step S404, the process for renewing the PV viewing history information A1 correspondingly to the fact that the affirmative result can be obtained in step S402. For this, first the content ID of the current promotion video is recognized. The current promotion video mentioned here is the promotion video of which completion has been judged in the previous step S403.

Further, out of the PV viewing history information A1 held in the RAM 11b, is specified the PV viewing history information A1 is stored in the user's use history information having the user ID of the user set as the current user.

Further, in the PV viewing history information A1 specified as mentioned above, the number of times of viewing corresponding to the content ID of the current promotion video previously recognized is rewritten with its value being incremented.

Next, will be described the process for changing the display of the cells on the music gage area 204 on the top screen picture 200 shown in Fig. 4, in accordance with the above-mentioned renewal of the PV viewing history information A1.

In the process shown in Fig. 19, first, in step S501, a wait is done for the renewal of the PV viewing history information A1 of the user set as the current user. When it is judged that the renewal has been done, the processing proceeds to the process in step S502.

In step S502, the renewed PV viewing history information A1 is referred to. Then, on the basis of the referred result, in the PV viewing history information A1, the content ID, of which the value of the number of times of viewing is zero, is recognized. After this, the top screen picture 200 is generated so as to display the cells 204a on the music gage area 204 corresponding to the recognized content ID.

Further, in the screen picture generation process of the top screen picture 200 in step S103 previously shown in Fig. 15, the display of the cells 204a on the music area 204 is carried out in accordance with the content of the PV viewing history information A1 at that instance. During this, as one of processes in step S103, the process from step S502 to S503 mentioned above is executed.

Furthermore, as described with reference to Fig. 1, in the broadcasting of the promotion videos, the rankings are renewed every week. In the present embodiment, in accordance with

the renewal of the rankings, the PV viewing history information A1 and the marking information A2 is cleared. Thus, all of the cells 204a on the music gage area 204 displayed on the basis of the PV viewing history information A1 become in non-display conditions in response to clearance of the PV viewing history information A1.

Next, will be described an example of the processing operation for providing a service in accordance with the user's use history. As described earlier, if a user completes the picture on the music gage area 204 by viewing all promotion videos having rankings from the first to hundredth places therethrough, as a reward, the user is provided with the right of the entry of a present. Here, will be described the processing dealing with the case.

Such a process is provided by displaying the entry button 213 on the top screen picture 200 in accordance with the fact that a user has viewed all promotion videos of the first to hundredth rankings therethrough as described with reference to Fig. 4.

Fig. 20 describes the processing for this. Also in this case, first, a wait is done for the renewal of the PV viewing history information in step S601. Then, if it is judged that the PV viewing history information is renewed, the processing moves to the process in step S602.

In step S602, the renewed PV viewing history information is referred to. In the following step S603, the information about the number of times of viewing is scanned to

judge whether a value of "0" exists in the number of times of viewing.

Here, if at least a value of "0" exists in the number of times of viewing, the processing shown in this drawing terminates as it is.

On the other hand, if no value of "0" exists in the number of times of viewing (all contents have been viewed of first to hundredth places therethrough), the processing proceeds to step S604. In step S604, a screen picture is generated such that, for example, the entry button 213 prepared as an entity of the GUI content is pasted on the top screen picture 200. This causes the top screen picture 200 to be displayed, wherein the entry button 213 is newly displayed.

After the display of the entry button 213, if an operation to this entry button 213 is done, the processing jumps to the location where a link is set in accordance with this. For example, a process for changing the display to the GUI screen picture for the predetermined procedure of the entry for a present is executed in accordance with the script. In other words, the display of the entry button 213 provides a service as the so-called entry of present to users.

Here, will be additionally described an example of a mode for providing the operation corresponding to the first to third features described as the present embodiment. However, regarding the additional example of the mode in which the display of the GUI screen picture is changed in accordance with the variation of the content of the content as the promotion

video as the first feature, it is supposed that there are various possible examples, the description is omitted here.

Then, first, regarding the mode in which the display of the GUI screen picture is varied in accordance with the history of use of the digital satellite broadcast receiver 1 by the user as the second feature, there is further the following possible example.

First, in one example, the display of the GUI screen picture is changed in accordance with the inclination of the user. For example, if the promotion video is broadcasted, the artist of which is judged to be agreeable to the user, it is considered that the display is changed in order to draw the user's attention to the screen picture. Alternatively, it can be considered that a noticeable display is carried out just before the broadcasting the promotion video, the artist of which is agreeable to the user. Further, it also can be considered that the display of live information (concert ticket information) of the artist who is agreeable to the user is prioritized.

The preference of the artist of a user can be recognized by reference to the content of, for example, the PV viewing history information A1. In other words, with referenced to the content ID of which the number of times of viewing is large, the music information list is searched for the artist corresponding to this content ID. The use of the information of the artist preferred by the user, obtained as mentioned above provides the display of the above-mentioned GUI screen picture.

Further, there is the following possible mode, as the third

feature, in which the content of the provided service is changed through the GUI screen picture in accordance with the history of the user's service use.

For example, depending on the operation to the GUI screen picture according to the present embodiment, shopping merchandizes other than the ticket, CDs, and DVDs is possible. Then, for example, a service can be provided to make free a paper view program relating the artist of the purchased ticket after the user purchased the ticket. In this case, as a manner of presenting a service on the GUI screen picture, for example, a message "The program OOOO on the channel XX becomes free" or the like and a corresponding button are displayed in accordance with the script of the GUI content. Providing such a service can be achieved by the use, for example, of the service use history information A3.

Further, in the present embodiment, since the user's private information is also stored as the user related information 11a, the display of the GUI screen picture can be changed using the user's private information.

For example, the date of birth of the user can be recognized with the user's private information. Then, it can be considered that fortunetelling is displayed on the basis of the date of birth of the user. In this case, an entity for displaying fortunetelling as a GUI content is prepared. Then, on the basis of the recognized birth date from the user's private information, one of entities for fortunetelling is selected for displaying. For example, on the top screen picture shown in Fig. 4, at the fortunetelling area 214, constellation fortunetelling is displayed

for the user set as the current user.

Further, on the basis of the date of birth of the user, on the birthday, a birthday message can be displayed.

Furthermore, because the GUI content performs the GUI screen picture display using the screen picture data of entities, it can be considered that such screen picture data is changed in accordance with the user's operation. For example, there are prepared as the BUI content a plurality of pieces of the screen picture data of the entity as the background screen picture part 220 that is a background on the top screen picture 200. Then, the user's predetermined operation enables to select the screen picture data of the background screen picture part 220 in accordance with the preference optionally. If the setting information is stored in the user related information in the ROM, after this, the background screen picture part 220 is displayed with the selected background screen picture.

Further, it is also possible to similarly select a template for the entire part of the GUI screen picture.

Further, the digital satellite broadcast receiver 1 according to the present embodiment is provided with a drive for reproducing a removable media, and then, the reproduced screen picture data from the inserted removable media is written in the ROM 11. Further, it is also considered that the screen picture data stored in the ROM 11 can be registered as an entity such as the above-mentioned background screen picture part 220 or a UI template.

Furthermore, similarly, it is also considered that the screen picture data acquired through a network can be registered as an entity such as the above-mentioned background screen picture part 220 or a UI template.

Further, the present invention is not limited to the above-described embodiments.

For example, the contents of the user related information shown in respective drawing are only minimum information for the picture processing or the service providing as described as embodiments. Thus, in fact, variety of elements of the user related information might be included. In accordance with this, variety of possible operations can be considered.

Further, the system structure is also not limited to that described in the above-described embodiment. For example, instead of making the user related information recorded and held in the digital satellite broadcast receiver 1, it is also possible that the user related information is made to be stored in a server or the like connected to the digital satellite broadcast receiver 1 and then, read out by the digital satellite broadcast receiver 1 to use it. Further, the application of the GUI content is not limited to the BML, but may be, for example, an application with another markup language.

INDUSTRIAL APPLICABILITY

As described above, this invention is constructed so as to be able to change the content of the service provided on the GUI in accordance with the operation or behavior of a user on

the basis of viewing a first content of picture/audio.

This results in a change in the content of the GUI screen picture in accordance with the some action that is caused by the user's reaction caused by viewing the first content of the picture/audio, so that the user can receive the service according to its own inclination in viewing. In this respect, the entertainment characteristic, the use worth, the convenience can be increased for the user.

Further, such a change in GUI can be obtained by that the receiver executes the process in accordance with the script of the second content (GUI content). In other words, the process concluded only in the receiver can provide the change in the GUI adaptively in response to the change of the content of the first content.

This means that it is sufficient that the broadcast side produces the second content corresponding to the application data so as to obtain a desired operation of the GUI, but does not mean that it is unnecessary to edit the first content, for example, corresponding to the general broadcast program. It is not easy to edit the first content, for example, because it includes an editing process for the video signal. Thus, the merit is large in providing the above-described change in the picture by editing or preparing the second content.